Local Protection Project

Housatonic River

Pittsfield, Massachusetts

Operations and Maintenance Manual

January 1985

US Army Corps
of Engineers
New England Division

OPERATION AND MAINTENANCE MANUAL
LOCAL PROTECTION PROJECT
SOUTHWEST BRANCH, HOUSATONIC RIVER
PITTSFIELD, MASSACHUSETTS

FOREWORD

The successful functioning of the local protection works is not assured solely by constructing auxiliary culverts to augment river discharges during flooding. If the system is to perform the functions for which it was designed, it must be carefully maintained during normal flow stages and following flood periods.

The need for proper maintenance cannot be too highly stressed. Large damages may be incurred through operating failure caused by deterioration or damage that would have been eliminated by proper maintenance.

Necessary maintenance requires that responsible local persons have a thorough understanding of the recommended methods of maintaining the system. It is the purpose of this manual to provide complete information so that all parties may fully understand their responsibilities in maintaining the flood protection system in accordance with the regulations prescribed by the Secretary of the Army as amplified by this manual.

The general flood control Regulations for Maintenance and Operation of Flood Control Works quoted herein were approved by the acting Secretary of War on 9 August 1944. Upon establishment of the Department of Defense the improvement of rivers and harbors and other waterways for flood control and other purposes, formerly under the jurisdiction of the Secretary of War, became the responsibility of the Secretary of the Army. References herein to the Secretary of War and War Department shall be construed to mean, respectively, the Secretary of the Army and the Department of the Army. Where reference is made to the District Engineer in the Regulations included in this manual, it shall be construed to mean the Division Engineer, New England Division, Corps of Engineers.

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SECTION I
INTRODUCTION

1. AUTHORIZATION

The flood protection project on the Southwest Branch of the Housatonic River, Pittsfield, Massachusetts was authorized by the Chief of Engineers on July 17, 1981 pursuant to the authority contained in Section 205 of the 1946 Flood Control Act as amended.

2. LOCATION

The city of Pittsfield is located in Berkshire County in Western Massachusetts, about 40 miles northwest of the City of Springfield. The project site is located on the left (north) bank of the Southwest Branch of the Housatonic River at Clapp park where the B&M railroad crosses the river.

3. DESCRIPTION OF PROBLEM

The existing stone arch culvert under the B&M railroad embankment is unable to adequately discharge river flows during periods of heavy rainfall. Water backs up into the surrounding area endangering public, commercial and residential properties up to 3000 feet upstream of the culvert.

4. DESCRIPTION OF PROJECT

The project consists of three 8 foot inside diameter auxiliary circular reinforced concrete conduits located adjacent to the orginal stone arch conduit. These new conduits increase the flow area by about 150 square feet and augment discharge through the railroad embankment whenever the river rises three feet above normal stage (elevation 963.0 NGVD).

5. PROTECTION PROVIDED

Construction of the auxiliary conduits will reduce the flooding problem to properties upstream of the railroad embankment.

6. CONSTRUCTION HISTORY

Construction of the local protection project was initiated in February 1982 and was essentially completed in May 1984. The project was constructed by J.H. Maxymillian, Inc. of Lanesboro, Massachusetts. The federal cost for the project was approximately $420,000.

7. ASSURANCES OF LOCAL COOPERATION

The assurances of local cooperation require that operation and maintenance and their resultant annual cost be provided by the city. A copy of the formal assurances is included as Appendix B of this manual.

Pertinent local cooperation requirements are as follows:

"a) Provide, without cost to the United States, all lands, easements, and rights-of-way necessary for the construction and maintenance of the project.

"b) Hold and save the United States free from damages due to the construction, operation, and maintenance of the project except damages due to the fault of the United States or its Contractors.

"c) Maintain and operate the project after completion in accordance with regulations prescribed by the Secretary of the Army.

"d) Prevent encroachments which might interfere with proper functioning of the project.

"e) Comply with requirements of non-Federal cooperation specified in Sections 210 and 305 of the Public Law 91-646, approved January 2, 1971, entitled the "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970."

8. PLANS

Reduced size drawings showing the project as actually constructed are included as Appendix D.

SECTION II
GENERAL REGULATIONS

9. PURPOSE OF THIS MANUAL

The purpose of this manual is to present detailed information to be used as a guide in complying with "Flood Control Regulations - Maintenance and Operation of Flood Control Works" as approved by the Acting Secretary of War on 9 August 1944, and published in this volume as Appendix A. In executing assurances of local cooperation, the city has agreed to maintain and operate the complete works in accordance with these regulations. The regulations which are intended to cover all local protection projects constructed by the Department throughout the United States are general in nature, and obviously cannot give detailed instructions for the maintenance and operation of a specific project. The details set forth in this manual for maintenance and operation of the project are intended to supplement the regulations to permit obtaining all the benefits and protection against flooding for which the project was designed. Failure to maintain and operate the project as required by the regulations and as detailed herein would result in severe property losses.

10. GENERAL RULES AND REGULATIONS

Paragraph 208.10(a) of the regulations prescribed by the Secretary of War gives general rules for the maintenance and operation of structures and facilities constructed by the United States for local protection. Applicable portions are quoted below to avoid the necessity for cross reference and are further defined by remarks under each quotation.

"(1) The structures and facilities constructed by the United States for local flood protection shall be continuously maintained in such a manner and operated at such times and for such periods as may be necessary to obtain the maximum benefits."

These requirements cannot be overstressed, and the city authorities must make adequate provisions for funds, personnel, equipment and materials to allow for the proper maintenance and operation of the streambank protective works.

"(2) The State, political subdivision thereof, or other responsible local agency, which furnished assurance that it will maintain and operate flood control works in accordance with regulations prescribed by the Secretary of War, as required by law, shall appoint a permanent committee consisting of or headed by an official hereinafter called the "Superintendent," who shall be responsible for the development and maintenance of, and directly in charge of, an organization responsible for the efficient operation and maintenance of all the structures and facilities during flood periods and for continuous inspection and maintenance of the project works during the periods of low water, all without cost to the United States."

The committee shall be composed of competent members, preferably experienced in engineering and construction work of a nature similar to the flood protection works. The committee must be given broad authority to carry out its responsibilities. The Game, address, and office and home telephone numbers of the Superintendent, and any changes thereto, shall be promptly furnished the Division Engineer, U.S. Army Corps of Engineers, New England Division, Waltham, Massachusetts 02254, Attn: Project Operations Branch.

"(3) A reserve supply of materials needed during a flood emergency shall be kept on hand at all times."

"(4) No encroachment or trepass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the rights-of-way for the protective facilities." The disposal of rubbish, erection of fences, or barriers, the painting or erection of signs, the attachment of clotheslines to floodwalls, or any form of trespassing on the project shall be prohibited."

"(5) No improvement shall be passed over, under, or through the walls, dikes, improved channels or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-way, nor shall any change be made in any feature of the works without prior determination by the District Engineer of the War Department or his authorized representative that such improvement, excavation, construction or alteration will not adversely affect the functioning of the protective facilities. Such improvements or alterations as may be found to be desirable and permissable under the above determination shall be constructed in accordance with standard engineering practice. Advice regarding the effect of proposed improvement or alterations on the functioning of the project and information concerning methods of construction acceptable under standard engineering practice shall be obtained from the Dstrict Engineer or, if otherwise obtained, shall be submitted for his approval. Drawings or prints showing such improvements or alterations as finally constructed shall be furnished the District Engineer after completion of the work."

Any contempated improvements or alterations as outlined above must be submitted to the Corps of Engineers, Waltham, Massachusetts, and the approval of the Division Engineer obtained prior to the city authorizing the work. All requests for approval shall be in writing and complete drawings in duplicate, one set of which shall be in reproducible form, must be submitted along with a full description of the work intended. The city will be held responsible for obtaining prior approval from the Corps of Engineers for any improvements or alterations proposed by itself, private parties or any public parties. The city shall furnish the Division Engineer as-built drawings, in duplicate, of the completed work.

"(6) It shall be the duty of the Superintendent to submit a semiannual report to the District Engineer covering inspection, maintenance and operation of the protective works."

See paragraph 13 for instruction on submitting reports.

"(7) The District Engineer or his authorized representatives shall have access at all times to all portions of the protective works."

The Division Engineer or his representatives will make periodic inspections of the protective works to determine if the project is being properly maintained and operated by the city. "Follow-up" inspections, when necessary, will be made to determine if deficiencies observed during the inspection have been corrected. A report with the results of each inspection will be furnished to the city for appropriate action.

"(8) Maintenance measures or repairs which the District Engineer deems necessary shall be prompty taken or made."

The city should maintain the facilities and keep them in good repair and not wait for the Division Engineer to call such matters to its attention. Upon request, the Division Engineer will advise the city how to make any major repairs to the facilities.

"(9) Appropriate measures shall be taken by local authorities to insure that the activities of all local orgainizations operating public or private facilities connected with the protective works are coordinated with those of the Superintendent's organization during flood periods.

The city should formulate plans and negotiate agreements with organizations and companies, that are operating facilities connected with the protective works, to insure that their activities will be properly coordinated with the Superintendent's organization during flood periods.

"(10) The War Department will furnish local interests with an Operation and Maintenance Manual for each completed project, to assist them in carrying out their obligations under these regulations."

The flood control committee should familiarize itself with the contents of this manual. The city authorities are encourage to call on the Division Office of the Corps of Engineers for any additional advice or instructions required by them in carrying out the city's obligations for maintaining and operating the protective works.

11. MAINTENANCE

a. The word "maintenance" as used in this manual applies to the upkeep, repair, replacement and care of the work constructed by the United States and turned over to the city. If the work is neglected there will be deterioration and possible failure in flood time when there is dire need of dependable protection.

b. Maintenance includes a regular walking inspection over the entire system. The purpose of the inspection is to detect any deterioration of project features that indicates a need for repair or replacement.

12. OPERATION

a. The term "operation" as used in this manual, refers to the actual functions of the various features of the protection works during abnormally high stages of the river.

b. When abnormal stages are expected, it is important that the Superintendent make immediate decisions, take prompt action and has the authority to carry out his decisions tn insure proper continued operation of the protection work.

c. To insure correct operation the following items are considered to be essential:

(1) At least one person (preferably 2 or 3) be familiar with the protective works including the various types of materials comprising the facility.

(2) The sources of these materials should be established ahead of time. If possible a small amount of each type of material should be stockpiled nearby for quick use.

(3) Sufficient loading, hauling and placing equipment should be readily available for providing and placing the repair materials.

(4) Sufficient experienced personnel should be readily available for patrolling and performing the repair work.

13. REPORTS

a. The regulations prescribed by the Secretary of the Army call for semi-annual reports to be submitted by the Superintendent to the Division Engineer covering inspection and maintenance. Inspection of the protective facilities shall be made immediately prior to flood seasons, immediately following floods, and otherwise at intervals not exceeding 90 days as required by regulations.

b. To assist the Superintendent in making his inspection, a sample form is included in Appendix C. The Superintendent shall have additional copies printed for use in submitting his reports.

c. The semi-annual reports shall be submitted in triplicate to the Division Engineer each February and August. The reports will be submitted in letter form with copies of the inspection forms covering the inspections made during the period of the reports. The reports shall cover the following points:

(1) A description of the maintenance work performed in the preceding six months.

(2) The number and classification of men working on maintenance, regularly and intermittently.

(3) Description of any work performed by contract on the repair or improvements of the project.

SECTION III
FLOOD PROTECTION WORK

14. DESCRIPTION

The project consists of three 8 foot inside diameter auxiliary circular reinforced concrete conduits located adjacent to the original stone arch conduit. These new conduits increase the flow area by about 150 square feet and augment discharge through the railroad embankment whenever the river rises three feet above normal stage (elevation 963.0 NGVD).

15. MAINTENANCE

Paragraph 208.10(g)(1) of the prescribed regulations sets forth rules for the maintenance of channels and floodways. These rules are quoted below, followed by brief comments where applicable to clarify these rules as they apply to the project.

"Channels and Floodways. - (1) Maintenance. - periodic inspections of improved channels and floodways shall be made by the Superintendent to be certain that;

(i) The channel or floodway is clear of debris, weeds and wild growth."

All debris and growth at the protective work shall be removed promptly. Failure to remove wild growth could eventually lead to structural damage to the slope from the root system and a loss of integrity to the project. If left unchecked, growth will cause reduced channel capacity.

"(ii) The channel or floodway is not being restricted by the depositing of waste materials, building or unauthorized structures or other encroachments;"

Dumping of waste materials or any types of encroachment on the protective work shall be prohibited and prompt steps shall be taken to remove or have removed any such encroachments.

"(iii) The capacity of the channel or floodway is not being reduced by the formation of shoals;" Shoal areas should be removed, but care should be exercised that slopes of the channel and existing banks are not undercut or damaged. Existence of shoal areas will be apparent from inspections during time of low flow.

"(iv) Banks are not being damaged by rain or wave wash and that no sloughing of bank has occurred;"

Banks damaged by rain or wave wash or sloughing shall be inspected for damage and be repaired promptly, using materials similar to that used in their original construction.

Such inspection shall be made at intervals not to exceed 90 days. Immediate steps will be taken to remedy any adverse conditions disclosed by such inspections.

16. OPERATION

Paragraph 209.10(g)(2) of the prescribed regulations gives rules for operation of channels and floodways. These rules are detailed below with regard to the project.

(1) Operation. The bank of the river along the project area at the railroad crossing shall be patrolled during periods of high water. Immediate appropriate measures shall be taken to prevent the formation of jams of ice or debris, and large objects which become lodged in culverts or against the inlet and outlet channel structures shall be removed. The project shall be thoroughly inspected immediately following each major high water period. As soon as practicable thereafter, all snags and other debris shall be removed and all damage to the stone protection shall be repaired. Inspections shall be made inside each of the culverts to insure that pipe joints are sealed and that fine materials are not being piped through joints which could eventually undermine the stability of the system. Immediate action shall be taken to grout and seal any cavities that may form. Spalled and damaged concrete surfaces shall be patched. Also, siltation could build up in the culverts and lead to a constricted flow pattern. Any build up of siltation shall be removed.

APPENDIX A

REGULATIONS PRESCRIBED BY THE

SECRETARY OF THE ARMY

TITLE 33—NAVIGATION AND NAVIGABLE WATERS

Chapter II—Corps of Engineers, War Department

PART 208—FLOOD CONTROL REGULATIONS

MAINTENANCE AND OPERATION OF FLOOD CONTROL WORKS

Pursuant to the provisions of section 3 of the Act of Congress approved June 22, 1936, as amended and supplemented (49 Stat. 1571; 50 Stat. 877; and 55 Stat. 638; 33 U. S. C. 701c; 701c-1), the following regulations are hereby prescribed to govern the maintenance and operation of flood control works:

§ 208.10 *Local flood protection works; maintenance and operation of structures and facilities.*—(a) *General.* (1) The structures and facilities constructed by the United States for local flood protection shall be continuously maintained in such a manner and operated at such times and for such periods as may be necessary to obtain the maximum benefits.

(2) The State, political subdivision thereof, or other responsible local agency, which furnished assurance that it will maintain and operate flood control works in accordance with regulations prescribed by the Secretary of War, as required by law, shall appoint a permanent committee consisting of or headed by an official hereinafter called the "Superintendent," who shall be responsible for the development and maintenance of, and directly in charge of, an organization responsible for the efficient operation and maintenance of all of the structures and facilities during flood periods and for continuous inspection and maintenance of the project works during periods of low water, all without cost to the United States.

(3) A reserve supply of materials needed during a flood emergency shall be kept on hand at all times.

(4) No encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the rights-of-way for the protective facilities.

(5) No improvement shall be passed over, under, or through the walls, levees, improved channels or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-way, nor shall any change be made in any feature of the works without prior determination by the District Engineer of the War Department or his authorized representative that such improvement, excavation, construction, or alteration will not adversely affect the functioning of the protective facilities. Such improvements or alterations as may be found to be desirable and permissible under the above determination shall be constructed in accordance with standard engineering practice. Advice regarding the effect of proposed improvements or alterations on the functioning of the project and information concerning methods of construction acceptable under standard engineering practice shall be obtained from the District Engineer or, if otherwise obtained, shall be submitted for his approval. Drawings or prints showing such improvements or alterations as finally constructed shall be furnished the District Engineer after completion of the work.

(6) It shall be the duty of the superintendent to submit a semiannual report to the District Engineer covering inspection, maintenance, and operation of the protective works.

(7) The District Engineer or his authorized representatives shall have access at all times to all portions of the protective works.

(8) Maintenance measures or repairs which the District Engineer deems necessary shall be promptly taken or made.

(9) Appropriate measures shall be taken by local authorities to insure that the activities of all local organizations operating public or private facilities connected with the protective works are coordinated with those of the Superintendent's organization during flood periods.

(10) The War Department will furnish local interests with an Operation and Maintenance Manual for each completed project, or separate useful part thereof, to assist them in carrying out their obligations under these regulations.

(b) *Levees.*—(1) *Maintenance.* The Superintendent shall provide at all times such maintenance as may be required to insure serviceability of the structures in time of flood. Measures shall be taken to promote the growth of sod, exterminate burrowing animals, and to provide for routine mowing of the grass and weeds, removal of wild growth and drift deposits, and repair of damage caused by erosion or other forces. Where practicable, measures shall be taken to retard bank erosion by planting of willows or other suitable growth on areas riverward of the levees. Periodic inspections shall be made by the Superintendent to insure that the above maintenance measures are being effectively carried out and, further, to be certain that:

(i) No unusual settlement, sloughing, or material loss of grade or levee cross section has taken place;

(ii) No caving has occurred on either the land side or the river side of the levee which might affect the stability of the levee section;

(iii) No seepage, saturated areas, or sand boils are occurring;

(iv) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged;

(v) Drains through the levees and gates on said drains are in good working condition;

(vi) No revetment work or riprap has been displaced, washed out, or removed;

(vii) No action is being taken, such as burning grass and weeds during inappropriate seasons, which will retard or destroy the growth of sod;

(viii) Access roads to and on the levee are being properly maintained;

(ix) Cattle guards and gates are in good condition;

(x) Crown of levee is shaped so as to drain readily, and roadway thereon, if any, is well shaped and maintained;

(xi) There is no unauthorized grazing or vehicular traffic on the levees;

(xii) Encroachments are not being made on the levee right-of-way which might endanger the structure or hinder its proper and efficient functioning during times of emergency.

Such inspections shall be made immediately prior to the beginning of the flood season; immediately following each major high water period, and otherwise at intervals not exceeding 90 days, and such intermediate times as may be necessary to insure the best possible care of the levee. Immediate steps will be taken to correct dangerous conditions disclosed by such inspections. Regular maintenance repair measures shall be accomplished during the appropriate season as scheduled by the Superintendent.

(2) *Operation.* During flood periods the levee shall be patrolled continuously to locate possible sand boils or unusual wetness of the landward slope and to be certain that:

(i) There are no indications of slides or sloughs developing;

(ii) Wave wash or scouring action is not occurring;

(iii) No low reaches of levee exist which may be overtopped;

(iv) No other conditions exist which might endanger the structure.

Appropriate advance measures will be taken to insure the availability of adequate labor and materials to meet all contingencies. Immediate steps will be taken to control any condition which endangers the levee and to repair the damaged section.

(c) *Flood walls.*—(1) *Maintenance.* Periodic inspections shall be made by the Superintendent to be certain that:

(i) No seepage, saturated areas, or sand boils are occurring;

(ii) No undue settlement has occurred which affects the stability of the wall or its water tightness;

(iii) No trees exist, the roots of which might extend under the wall and offer accelerated seepage paths;

(iv) The concrete has not undergone cracking, chipping, or breaking to an extent which might affect the stability of the wall or its water tightness;

(v) There are no encroachments upon the right-of-way which might endanger the structure or hinder its functioning in time of flood;

(vi) Care is being exercised to prevent accumulation of trash and debris adjacent to walls, and to insure that no fires are being built near them;

(vii) No bank caving conditions exist riverward of the wall which might endanger its stability;

(viii) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged.

Such inspections shall be made immediately prior to the beginning of the flood season, immediately following each major high water period, and otherwise at intervals not exceeding 90 days. Measures to eliminate encroachments and effect repairs found necessary by such inspections shall be undertaken immediately. All repairs shall be accomplished by methods acceptable in standard engineering practice.

(2) *Operation.* Continuous patrol of the wall shall be maintained during flood periods to locate possible leakage at monolith joints or seepage underneath the wall. Floating plant or boats will not be allowed to lie against or tie up to the wall. Should it become necessary during a flood emergency to pass anchor cables over the wall, adequate measures shall be taken to protect the concrete and construction joints. Immediate steps shall be taken to correct any condition which endangers the stability of the wall.

(d) *Drainage structures.*—(1) *Maintenance.* Adequate measures shall be taken to insure that inlet and outlet channels are kept open and that trash, drift, or debris is not allowed to accumulate near drainage structures. Flap gates and manually operated gates and valves on

drainage structures shall be examined, oiled, and trial operated at least once every 90 days. Where drainage structures are provided with stop log or other emergency closures, the condition of the equipment and its housing shall be inspected regularly and a trial installation of the emergency closure shall be made at least once each year. Periodic inspections shall be made by the Superintendent to be certain that:

(i) Pipes, gates, operating mechanism, riprap, and headwalls are in good condition;

(ii) Inlet and outlet channels are open;

(iii) Care is being exercised to prevent the accumulation of trash and debris near the structures and that no fires are being built near bituminous coated pipes;

(iv) Erosion is not occurring adjacent to the structure which might endanger its water tightness or stability.

Immediate steps will be taken to repair damage, replace missing or broken parts, or remedy adverse conditions disclosed by such inspections.

(2) *Operation.* Whenever high water conditions impend, all gates will be inspected a short time before water reaches the invert of the pipe and any object which might prevent closure of the gate shall be removed. Automatic gates shall be closely observed until it has been ascertained that they are securely closed. Manually operated gates and valves shall be closed as necessary to prevent inflow of flood water. All drainage structures in levees shall be inspected frequently during floods to ascertain whether seepage is taking place along the lines of their contact with the embankment. Immediate steps shall be taken to correct any adverse condition.

(e) *Closure structures*—(1) *Maintenance.* Closure structures for traffic openings shall be inspected by the superintendent every 90 days to be certain that:

(i) No parts are missing;

(ii) Metal parts are adequately covered with paint;

(iii) All movable parts are in satisfactory working order,

(iv) Proper closure can be made promptly when necessary;

(v) Sufficient materials are on hand for the erection of sand bag closures and that the location of such materials will be readily accessible in times of emergency.

Tools and parts shall not be removed for other use Trial erections of one or more closure structures shall be made once each year, alternating the structures chosen so that each gate will be erected at least once in each 3-year period. Trial erection of all closure structures shall be made whenever a change is made in key operating personnel. Where railroad operation makes trial erection of a closure structure infeasible, rigorous inspection and drill of operating personnel may be substituted therefor. Trial erection of sand bag closures is not required. Closure materials will be carefully checked prior to and following flood periods, and damaged or missing parts shall be repaired or replaced immediately.

(2) *Operation.* Erection of each movable closure shall be started in sufficient time to permit completion before flood waters reach the top of the structure sill. Information regarding the proper method of erecting each individual closure structure, together with an estimate of the time required by an experienced crew to complete its erection will be given in the Operation and Maintenance Manual which will be furnished local interests upon completion of the project. Closure structures will be inspected frequently during flood periods to ascertain that no undue leakage is occurring and that drains provided to care for ordinary leakage are functioning properly. Boats or floating plant shall not be allowed to tie up to closure structures or to discharge passengers or cargo over them.

(f) *Pumping plants*—(1) *Maintenance.* Pumping plants shall be inspected by the Superintendent at intervals not to exceed 30 days during flood seasons and 90 days during off-flood seasons to insure that all equipment is in order for instant use. At regular intervals, proper measures shall be taken to provide for cleaning plant, buildings, and equipment, repainting as necessary, and lubricating all machinery Adequate supplies of lubricants for all types of machines, fuel for gasoline or diesel powered equipment, and flash lights or lanterns for emergency lighting shall be kept on hand at all times. Telephone service shall be maintained at pumping plants. All equipment, including switch gear, transformers, motors, pumps, valves, and gates shall be trial operated and checked at least once every 90 days. Megger tests of all insulation shall be made whenever wiring has been subjected to undue dampness and otherwise at intervals not to exceed one year. A record shall be kept showing the results of such tests. Wiring disclosed to be in an unsatisfactory condition by such tests shall be brought to a satisfactory condition or shall be promptly replaced Diesel and gasoline engines shall be started at such intervals and allowed to run for such length of time as may be necessary to insure their serviceability in times of emergency. Only skilled electricians and mechanics shall be employed on tests and repairs. Operating personnel for the plant shall be present during tests. Any equipment removed from the station for repair or replacement shall be returned or replaced as soon as practicable and shall be trial operated after reinstallation. Repairs requiring removal of equipment from the plant shall be made during off-flood seasons insofar as practicable.

(2) *Operation.* Competent operators shall be on duty at pumping plants whenever it appears that necessity for pump operation is imminent. The operator shall thoroughly inspect, trial operate, and place in readiness all plant equipment. The operator shall be familiar with the equipment manufacturers' instructions and drawings and with the "Operating Instructions" for each station. The equipment shall be operated in accordance with the above-mentioned "Operating Instructions" and care shall be exercised that proper lubrication is being supplied all equipment, and that no overheating, undue vibration or noise is occurring. Immediately upon final recession of flood waters, the pumping station shall be thoroughly cleaned, pump house sumps flushed, and equipment thoroughly inspected, oiled and greased. A record or log of pumping plant operation shall be kept for each station, a copy of which shall be furnished the District Engineer following each flood.

(g) *Channels and floodways* — (1) *Maintenance.* Periodic inspections of improved channels and floodways shall be made by the Superintendent to be certain that:

(i) The channel or floodway is clear of debris, weeds, and wild growth;

(ii) The channel or floodway is not being restricted by the depositing of waste materials, building of unauthorized structures or other encroachments;

(iii) The capacity of the channel floodway is not being reduced by the formation of shoals;

(iv) Banks are not being damaged by rain or wave wash, and that no sloughing of banks has occurred;

(v) Riprap sections and deflection dikes and walls are in good condition;

(vi) Approach and egress channels adjacent to the improved channel or floodway are sufficiently clear of obstructions and debris to permit proper functioning of the project works

Such inspections shall be made prior to the beginning of the flood season and otherwise at intervals not to exceed 90 days. Immediate steps will be taken to remedy any adverse conditions disclosed by such inspections. Measures will be taken by the Superintendent to promote the growth of grass on bank slopes and earth deflection dikes. The Superintendent shall provide for periodic repair and cleaning of debris basins, check dams, and related structures as may be necessary.

(2) *Operation.* Both banks of the channel shall be patrolled during periods of high water, and measures shall be taken to protect those reaches being attacked by the current or by wave wash. Appropriate measures shall be taken to prevent the formation of jams of ice or debris. Large objects which become lodged against the bank shall be removed. The improved channel or floodway shall be thoroughly inspected immediately following each major high water period. As soon as practicable thereafter, all snags and other debris shall removed and all damage to banks, ripr. deflection dikes and walls, drainage outlets, or other flood control structures repaired.

(h) *Miscellaneous facilities* — (1) *Maintenance.* Miscellaneous structures and facilities constructed as a part of the protective works and other structures and facilities which function as a part of, or affect the efficient functioning of the protective works, shall be periodically inspected by the Superintendent and appropriate maintenance measures taken. Damaged or unserviceable parts shall be repaired or replaced without delay. Areas used for ponding in connection with pumping plants or for temporary storage of interior run-off during flood periods shall not be allowed to become filled with silt, debris, or dumped material. The Superintendent shall take proper steps to prevent restriction of bridge openings and, where practicable, shall provide for temporary raising during floods of bridges which restrict channel capacities during high flows.

(2) *Operation.* Miscellaneous facilities shall be operated to prevent or reduce flooding during periods of high water. Those facilities constructed as a part of the protective works shall not be used for purposes other than flood protection without approval of the District Engineer unless designed therefor. (49 Stat. 1571, 50 Stat. 877; and 55 Stat. 638; 33 U.S.C. 701c; 701c-1) (Regs. 9 August 1944, CE SPEWP)

[SEAL] J. A. ULIO,
Major General,
The Adjutant General.

(F. R. Doc. 44-12288; Filed, August 16, 1944; 9:45 a. m.]

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APPENDIX B

ASSURANCES OF LOCAL COOPERATION

AGREEMENT BETWEEN

THE UNITED STATES OF AMERICA

AND

THE COMMONWEALTH OF MASSACHUSETTS

FOR LOCAL COOPERATION AT THE

HOUSATONIC RIVER, PITTSFIELD, MASSACHUSETTS

LOCAL FLOOD PROTECTION PROJECT

THIS AGREEMENT entered into this 5th day of August, 1982, by and between the UNITED STATES OF AMERICA (hereinafter called the "Government"), represented by the Contracting Officer executing this agreement and the COMMONWEALTH OF MASSACHUSETTS (hereinafter called the "Commonwealth"), acting by and through the Department of Environmental Quality Engineering, with the consent of the Governor,

WITNESSETH THAT:

WHEREAS, construction of the local flood protection project at the Housatonic River, Pittsfield, Massachusetts, consisting of the addition of a culvert and floodpath on the southwest branch (hereinafter called the "Project"), was approved by the Chief of Engineers on 17 July 1981 under authority of Section 205 of the Flood Control Act of 1948, as amended by Section 61 of the Water Resources Development Act of 1974, approved 7 March 1974, Public Law 93-251; 33 USCA 701S; and

WHEREAS, the Commonwealth hereby represents that it has the authority and capability to furnish the non-Federal cooperation required by the Federal legislation authorizing the Project and by other applicable law.

NOW, THEREFORE, the parties agree as follows:

1. The Commonwealth agrees that if the Government shall commence construction of the local flood protection project on the southwest branch of the Housatonic River, Pittsfield, Massachusetts, substantially in accordance with the approval of the Chief of Engineers under authority of Section 205 of the 1948 Flood Control Act, as amended, the Commonwealth shall, in consideration of the Government commencing construction of such Project, fulfill the requirements of non-Federal cooperation in such legislation, to wit:

a. Provide, without cost to the United States, all lands, easements and rights-of-way necessary for the construction and maintenance of the Project.

b. Hold and save the United States free from damages due to the construction, operation and maintenance of the Project except where such damages are due to the fault of the United States or its contractors.

c. Maintain and operate the project after completion without cost to the United States in accordance with regulations prescribed by the Secretary of the Army.

d. Provide without cost to the United States all alterations and replacements of existing utilities.

e. Assume the responsibility for all costs in excess of the Federal cost limitation of $4,000,000.00.

f. Prevent future encroachment which might interfere with proper functioning of the project.

g. Comply with Title VI of the Civil Rights Act of 1964 (78 Stat. 241) and Department of Defense directive 5500.11 issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations.

h. Comply with the requirements of non-Federal cooperation specified in Sections 210 and 305 of Public Law 91-646, approved 2 January 1971, entitled "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970".

2. The Commonwealth hereby gives the Government a right to enter upon, at reasonable times and in a reasonable manner, lands which the Commonwealth owns or controls, for access to the Project for the purpose of inspection, and for the purpose of operation, repairing and maintaining the Project, if such inspection shows that the Commonwealth for any reason is failing to repair and maintain the Project in accordance with the assurances hereunder and has persisted in such failure after a reasonable notice in writing by the Government delivered to Commonwealth officials. No repair and maintenance by the Government in such event shall operate to relieve the Commonwealth of responsibility to meet its obligations as set forth in paragraph 1 of this agreement, or to preclude the Government from pursuing any other remedy at law or equity.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

THE UNITED STATES OF AMERICA

By _____

CARL B. SCIPLE
Colonel, Corps of Engineers
Division Engineer

FOR THE SECRETARY OF THE ARMY

Date 3 SEP '82

THE COMMONWEALTH OF MASSACHUSETTS
Department of Environmental
Quality Engineering

By _____

ANTHONY D. CORTESE
Commissioner

Date Aug. 5, 1982

APPROVED:

_____

EDWARD J. KING
Governor

APPROVED AS TO MATTERS OF FORM:

_____

Assistant Attorney General

CERTIFICATE OF AUTHORITY

I, Francis X. Bellotti do hereby certify that I am the Attorney General of the Commonwealth and that the Department of Environmental Quality Engineering is a legally constituted public body with full authority and legal capacity to perform the terms of the agreement between the United States of America and the Commonwealth of Massachusetts in connection with the Local Cooperation Agreement for the Local Flood Protection Project at the Housatonic River, Pittsfield, Massachusetts, and to pay damages, if necessary, in the event of the failure to perform in accordance with Section 221 of Public Law 91-611 and that the persons who have executed the contract on behalf of the Commonwealth of Massachusetts have acted within their statutory authority.

IN WITNESS WHEREOF, I have made and executed this certificate this 3rd day of August, 1978.

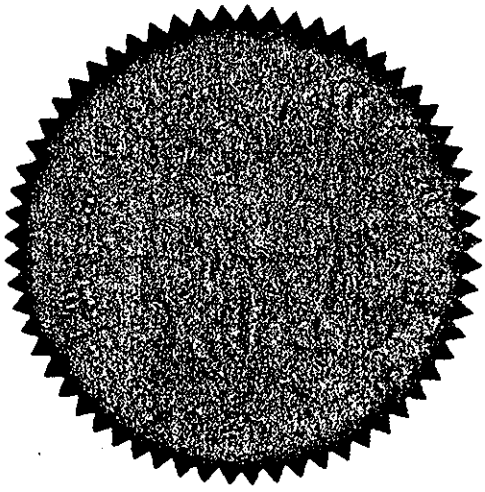
Attorney General of the Commonwealth

CERTIFICATION

I, Michael Joseph Connolly, do hereby certify that I am Secretary of the Commonwealth; that Anthony D. Cortese, who signed this Agreement on behalf of the Commonwealth, was then the Commissioner of the Department of Environmental Quality Engineering; that said Agreement was duly signed for and on behalf of the Commonwealth; and that said Agreement is within the scope of the Commissioner's powers; that Edward J. King was Governor of this Commonwealth on the date of approval of this agreement; and that Francis X. Bellotti was Attorney General at the time of his approval.

Michael Joseph Connolly

Secretary of the Commonwealth



AGREEMENT BETWEEN

THE COMMONWEALTH OF MASSACHUSETTS

AND

THE CITY OF PITTSFIELD

FOR LOCAL COOPERATION AT THE HOUSATONIC RIVER

PITTSFIELD, MASSACHUSETTS

LOCAL FLOOD PROTECTION PROJECT

THIS AGREEMENT entered into this 14th day of July, 1982, by and between the Commonwealth of Massachusetts (hereinafter called the "Commonwealth") acting by the Department of Environmental Quality Engineering, through the Division of Waterways and the City of Pittsfield (hereinafter called the "City"), WITNESSETH THAT:

WHEREAS, construction of the local flood protection project at the Housatonic River, Pittsfield, Massachusetts, consisting of the addition of a culvert and floodpath on the southwest branch (hereinafter called the "Project"), was approved by the Chief of Engineers on 17 July 1981 under authority of Section 205 of the Flood Control Act of 1948, as amended by Section 61 of the Water Resources Development Act of 1974, approved 7 March 1974, Public Law 93-251; 33 USCA 701S; and

WHEREAS, the City hereby represents that it has the authority and capability to furnish the non-Federal cooperation required by the Federal legislation authorizing the project and by other applicable law;

NOW, THEREFORE, the parties agree as follows:

A. The City agrees that, if the United States of America (hereinafter

called the "Government") shall commence construction of the local flood protection project on the southwest branch of the Housatonic River, Pittsfield, Massachusetts, substantially in accordance with said approval by the Chief of Engineers under authority of Section 205 of the 1948 Flood Control Act, as amended, the City shall in consideration of the Government commencing construction of such project, fulfill the requirements of non-Federal cooperation in such legislation, to wit:

1. Provide, without cost to the Commonwealth, all lands, easements and rights-of-way necessary for the construction and maintenance of the Project.

2. Hold and save the Commonwealth free from damages due to the construction, operation and maintenance of the Project except where such damages are due to the fault of the Government or its contractors.

3. Maintain and operate the project after completion without cost to the Commonwealth in accordance with regulations prescribed by the Secretary of the Army.

4. Provide without cost to the Commonwealth all alterations and replacements of existing utilities.

5. Assume the responsibility for all costs in excess of the Federal cost limitation of $4,000,000.00.

6. Prevent future encroachment which might interfere with proper functioning of the project.

7. Comply with Title VI of the Civil Rights Act of 1964 (78 Stat. 241) and Department of Defense directive 5500.11 issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations.

8. Comply with the requirements of non-Federal cooperation

specified in Sections 210 and 305 of Public Law 91-646, approved 2 January 1971, entitled "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970".

B. The City hereby gives the Commonwealth a right to enter upon, at reasonable times and in a reasonable manner, lands which the City owns or controls, for access to the project for purpose of inspection and for the purpose of completing, operating, repairing and maintaining the project, if such inspection shows the City for any reason is failing to complete, repair, and maintain the project in accordance with the assurances hereunder and has persisted in such failure after a reasonable notice in writing by the Commonwealth delivered to City Officials. No completion, operation, repair and maintenance by the Commonwealth in such event shall operate to relieve the City of responsibility to meet its obligations as set forth in Paragraph A of this agreement, or to preclude the Commonwealth pursuing any other remedy at law or equity.

C. This agreement is subject to the approval of the Attorney General.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first written:

CITY OF PITTSFIELD

Mayor, City of Pittsfield

ACCEPTED:

Anthony D. Cortese (dm)
Commissioner, Department of Environmental Quality Engineering

Chief Engineer, Division of Waterways

APPROVED AS TO FORM

Elaine K. McDennistan
Assistant Attorney General

CITY COUNCIL
PITTSFIELD
MASSACHUSETTS

CERTIFICATE

I, Francis J. Condron, the duly elected, qualified and acting City Clerk of the city of Pittsfield, in the County of Berkshire and Commonwealth of Massachusetts hereby certify that on July 13, 1982 at the regular meeting of the City Council of said city it was voted by unanimous vote of the eight members present to authorize the Mayor to enter into an agreement with the Commonwealth of Massachusetts, Department of Environmental Quality Engineering for proposed Flood Control Project in the Housatonic River in said city.

Witness my hand and the seal of said city this fourteenth day of July, 1982.

Francis J. Condron
City Clerk

APPENDIX C

INSPECTION REPORT FORMS

DESIGNATION OF SUPERINTENDENT

Name Of Project: _____

Location: _____

MAINTAINING MUNICIPAL AGENCY:

Agency: _____

Address: _____ Tel. No. _____

"SUPERINTENDENT" - as required by Section 208.10 (a) (2), Chap II, Title 33 USC

Name & Title: _____

Employed by: _____

Business Address: _____

Business Tel. No: _____

Nights, Sundays, Address: _____

Nights, Sundays, Tel. No: _____

Remarks:

Signed _____

Title: _____

Date: _____

NOTE: To be submitted and updated as necessary by the responsible agency which will maintain and operate the works in accordance with regulations prescribed by the Secretary of the Army as required by law (Title 33, Chap. 208, Sec II, USC).

LOCAL FLOOD PROTECTION PROJECT INSPECTION REPORT

Project:

Maintaining Agency:

Type Inspection: _____Semi-Annual Staff ____90 Day Interim

River Basin: Date of Inspection

Feature	Sat	Unsat	Deficiencies
PUMPING STATIONS - STRUCTURES			N/A
INTERIOR			N/A
EXTERIOR			N/A
PUMPS - MOTORS - ENGINES			N/A
TRIAL OPERATED			N/A
GENERAL CONDITION			N/A
POWER SOURCE			N/A
INSULATION TESTS			N/A
METAL INTAKES/OUTLETS			N/A
GATE VALVES			N/A
GATES - DRAINAGE STRUCTURES			N/A
TRIAL OPERATED			N/A
GENERAL CONDITION			N/A
LUBRICATION			N/A
RIVERBANK			
GENERAL CONDITION			
SLOPES/EROSION			
SAND BOILS/CAVING			
TRESPASSING			
SLOPE PROTECTION			
DRAINS			
STOP-LOGS - LOG BOOM			N/A
CONDITION OF LOGS			N/A
AVAILABILITY OF LOGS			N/A
HIGHWAY SLOTS			N/A
STORAGE FACILITIES			N/A
CHANNELS - OUTLET WORKS CHANNEL			
BANKS			
OBSTRUCTION CONTROL			

NED FORM JAN. 66 513

Feature	Sat	Unsat	Deficiencies
CONCRETE STRUCTURES			
SURFACE			
SETTLEMENT			
JOINTS			
DRAINS			
MISCELLANEOUS			
EMERGENCY OPER. PLAN			
EMERGENCY EQUIPMENT			
SEMI-ANNUAL REPORT			

Inspection Party:

Photographs Taken:

Remarks & Additional Comments:

(Indicate Here Observations, Discussions, Specific Feature Deficiencies, Recommendations and any other pertinent information. Use Continuation Sheet if necessary.)

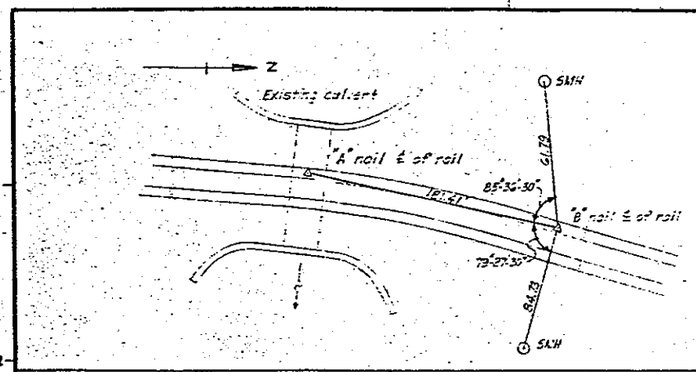
X ALL APPLICABLE ITEMS. IF UNSAT INDICATE SPECIFIC DEFICIENCIES. INDICATE IF NOT APPLICABLE.

DATE	INSPECTED BY: TYPED NAME & TITLE	SIGNATURE

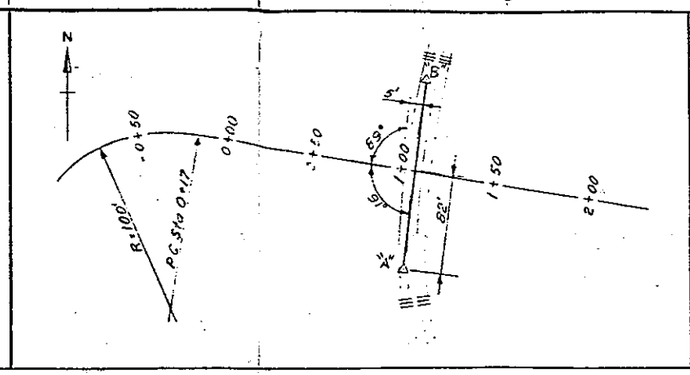
APPENDIX D

AS-BUILT DRAWINGS

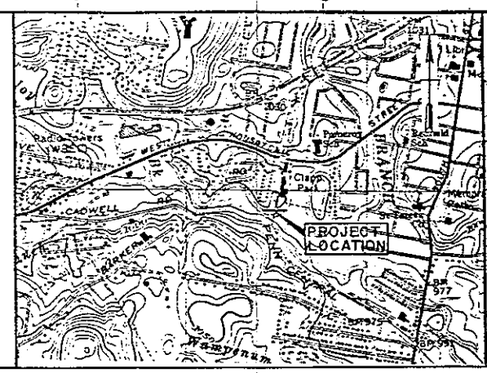
CORPS OF ENGINEERS — U. S. ARMY



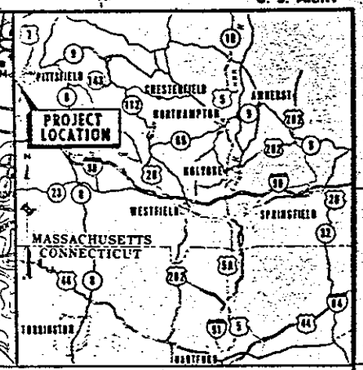
SURVEY TIES
NTS



TIES TO CONTROL LINE
NTS



VICINITY MAP
SCALE IN FEET
1000 0 1000 2000

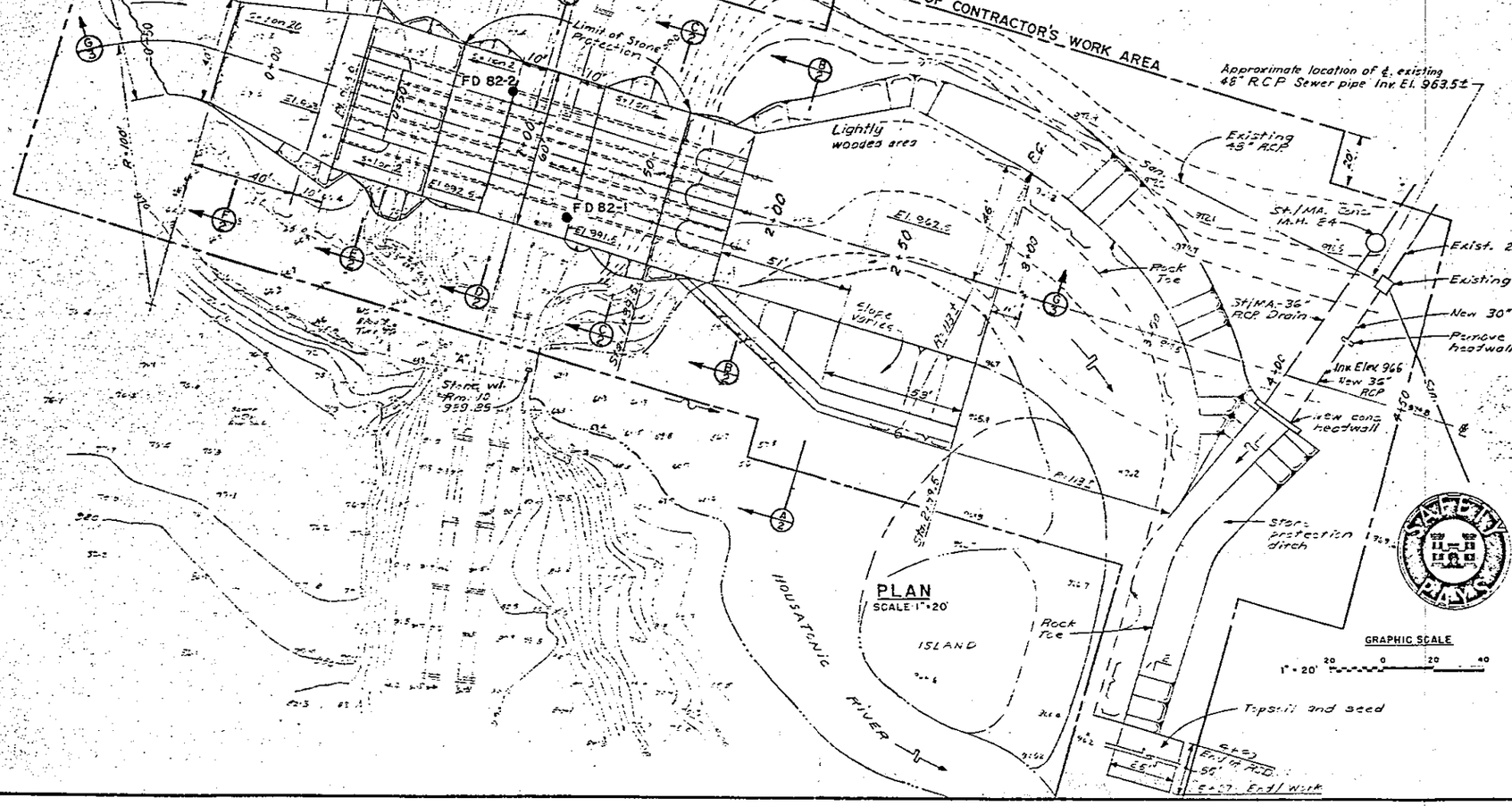


LOCATION MAP
SCALE IN MILES
0 5 10 15 20

INDEX TO DRAWINGS		
DWG. NO.	SH. NO.	TITLE
PIT-1	1	PLAN AND INDEX
PIT-1	2	SECTIONS
PIT-1	3	SECTIONS AND DETAILS

NOTES:

1. Dashed contour lines have been estimated.
2. Elevations refer to N.G.V.D. datum.
3. All slopes 1 on 2 unless noted otherwise.
4. Elevations underlined are final elevations.
5. All disturbed areas w/o stone protection to have top soil and ground cover.



LEGEND
- ● FD 82-1 U.S. Army, C. of E. boring
- ● B-3 Dept. of Public Works, City of Pittsfield

As Built Drawing
92 0060

REVISION	DATE	DESCRIPTION	BY
	9-3-82	Final Field corrections	

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES BY BAP | DR BY JBM | CK BY

SUBMITTED — CHIEF, CIVIL ENGR SECTION

APPROVAL RECOMMENDED — CHIEF, PLANS BRANCH

CHIEF, PROJECT MGT. BR.

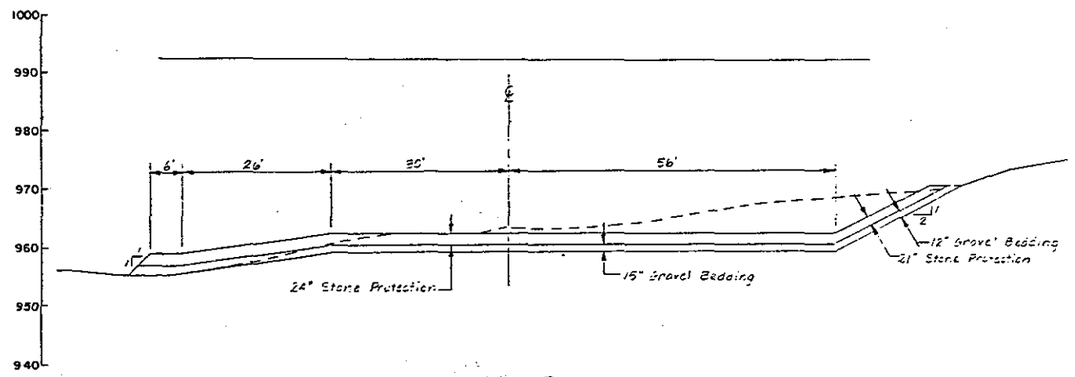
WATER RESOURCES DEVELOPMENT PROJECT
PITTSFIELD, MASSACHUSETTS
LOCAL PROTECTION PROJECT
PLAN AND INDEX
SOUTHWEST BRANCH, HOUSATONIC RIVER, MASS.

APPROVED — CHIEF, ENGINEERING DIVISION — DATE AUG. 1982

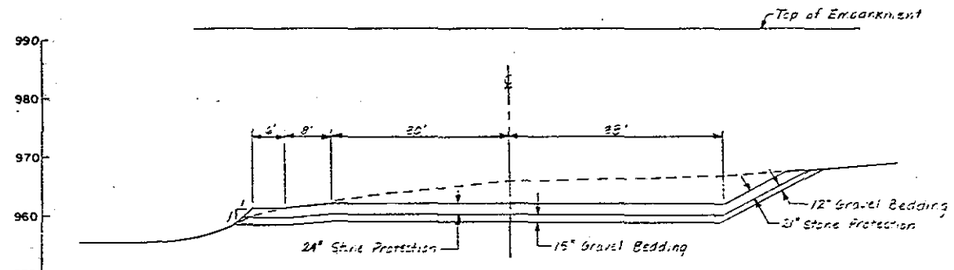
SCALE AS SHOWN | SPEC. NO. DACA33-82-B-0054

DRAWING NUMBER
PIT-1
SHEET 1

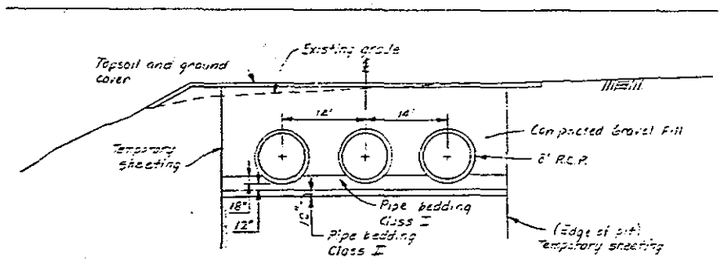
CORPS OF ENGINEERS — U. S. ARMY



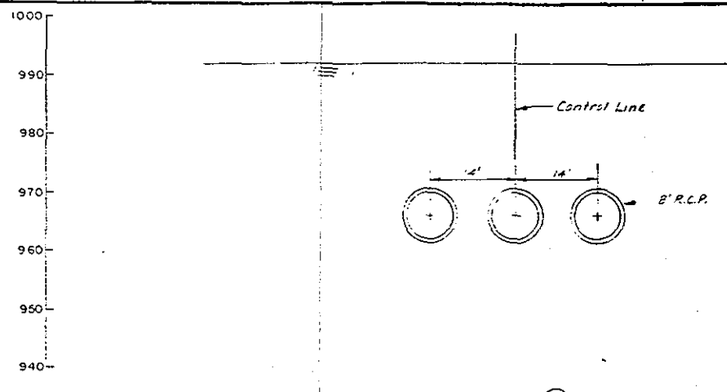
SECTION (A/1)



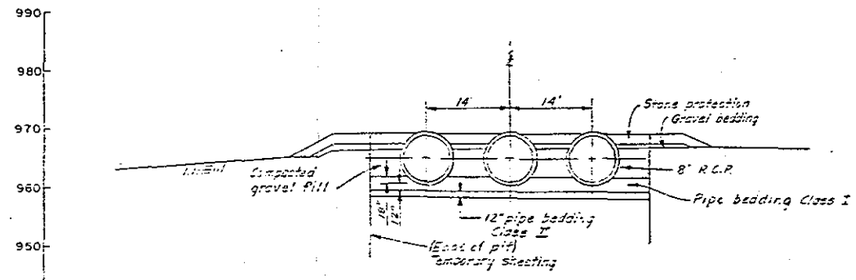
SECTION (B/1)



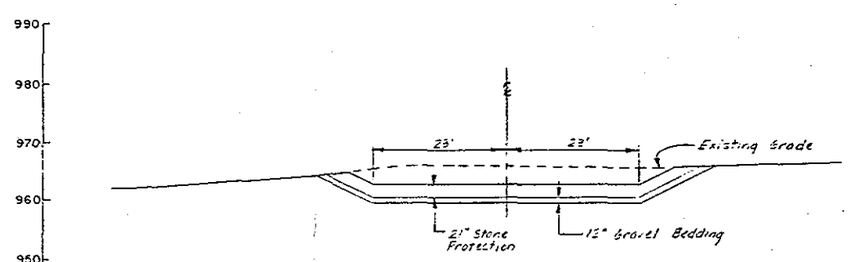
SECTION (C/1)



SECTION (D/1)



SECTION (E/1)



SECTION (F/1)

82 . 0060

GRAPHIC SCALES

1" = 10' 10 0 10 20

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY BAP | DR. BY S | CK. BY

SUBMITTED _____ CHIEF, CIVIL ENGR SECTION

APPROVAL RECOMMENDED _____ CHIEF, DESIGN BRANCH

REVIEWED _____ CHIEF, PROJECTS MGMT. BRANCH

APPROVAL RECOMMENDED _____ CHIEF, PROJECTS MGMT. BRANCH

WATER RESOURCES DEVELOPMENT PROJECT
PITTSFIELD, MASSACHUSETTS
LOCAL PROTECTION PROJECT
SECTIONS
SOUTHWEST BRANCH, HOUSATONIC RIVER, MASS.

APPROVED _____ CHIEF, ENGINEERING DIVISION

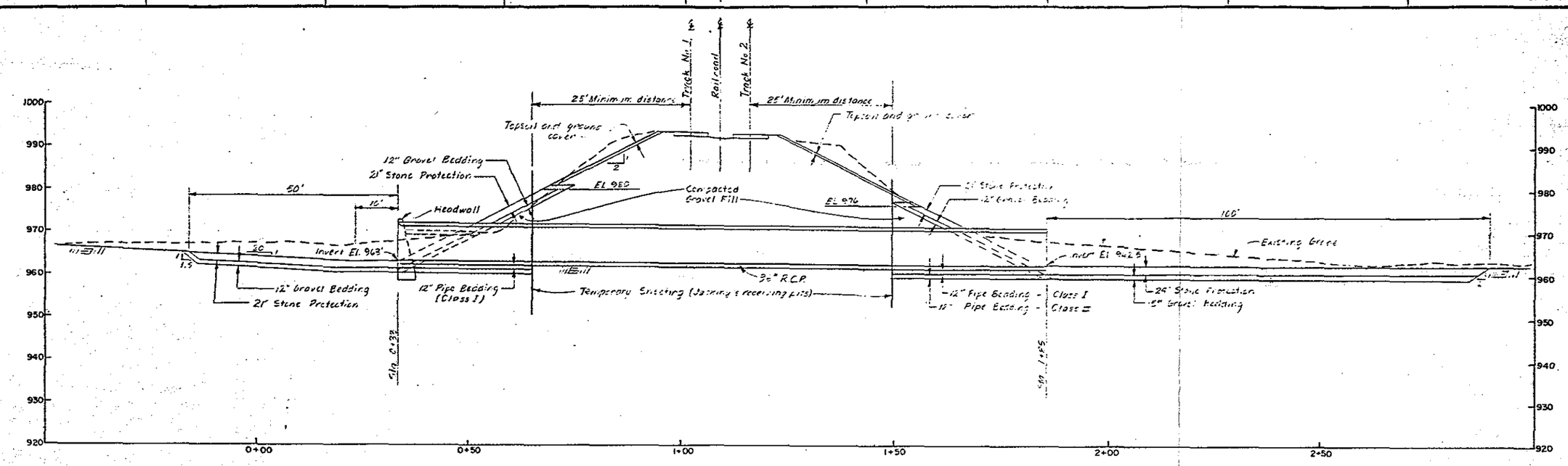
DATE AUG. 1982

SCALE AS SHOWN | SPEC. NO. DACW33-82-B-0054

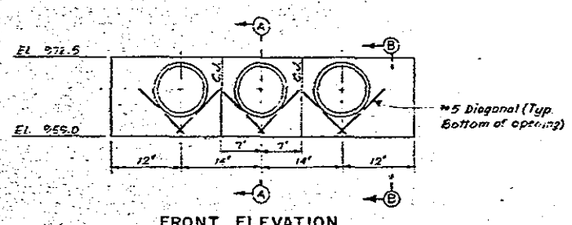
DRAWING NUMBER
PIT - 1

SHEET 2

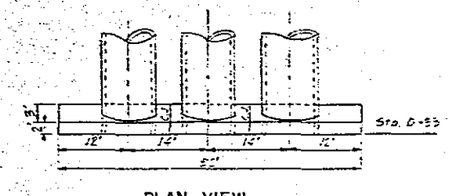
U. S. ARMY



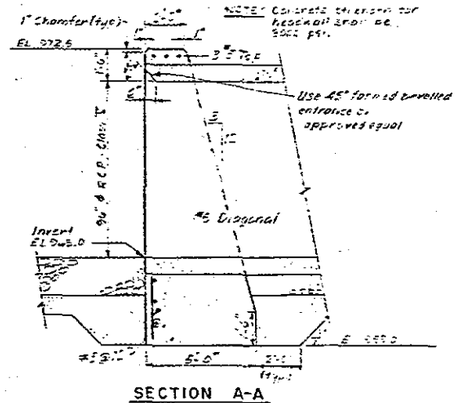
SECTION (G/1)
SCALE: 1"=10'



FRONT ELEVATION
SCALE: 1"=10'

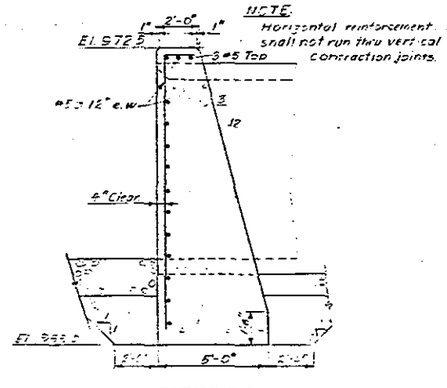


PLAN VIEW
SCALE: 1"=10'

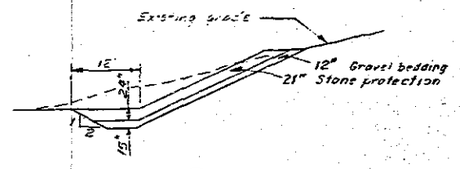


SECTION A-A
SCALE: 3/8" = 1'-0"

DETAIL - CONTRACTION JOINT
SCALE: 1"=10'



SECTION B-B
SCALE: 3/8"=1'-0"



SECTION (H/1)
SCALE: 1"=10'

HEADWALL DETAILS

GRAPHIC SCALES
1" = 10' 10' 0 10' 20'
3/8" = 1'-0" 4' 0 4'

DACW33-82-B-0054

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY B A D | DR. BY L S | CK. BY

ENGINEER

CHIEF, CIVIL ENGR SECTION

CHIEF, DESIGN BRANCH

CHIEF, ENGINEERING DIVISION

WATER RESOURCES DEVELOPMENT PROJECT
PITTSFIELD, MASSACHUSETTS
LOCAL PROTECTION PROJECT
SECTIONS AND DETAILS
SOUTHWEST BRANCH, HOUSATONIC RIVER, MASS

APPROVED _____ DATE AUG. 1982
CHIEF, ENGINEERING DIVISION

SCALE AS SHOWN; SPEC. NO. DACW33-82-B-0054

DRAWING NUMBER
PIT-1

SHEET 3